

BEST AVAILABLE COPY**DECLARATION OF MR. ROBERT J. GARTSIDE UNDER 37 C.F.R. 1.132**

I, Robert J. Gartside, hereby declare and say that:

1. I am Distinguished Technologist for ABB Lummus Global Inc. I have 34 years of experience in the petrochemical/refinery industry.
2. I am a co-inventor named in U.S. Patent Application No. 10/620,186. I have reviewed and am familiar with this application.
3. I have reviewed and am familiar with U.S. Patent No. 6,271,430 to Schwab et al., which has been cited in an Office Action for U.S. Patent Application No. 10/620,186.
4. U.S. Patent Application No. 10/620,186 provides a method of producing propylene from a stream containing C4 hydrocarbons, including isobutylene. The method as claimed in claim 1 includes the following: (a) subjecting a C4 olefin feed stream to autometathesis, (b) removing ethylene from the autometathesis product, (c) removing propylene from the remaining autometathesis product, (d) removing isobutylene after c, (e) purging a portion of the remaining autometathesis product after d, (f) subjecting the remaining C4+ portion from e to conventional metathesis with ethylene to produce a metathesis product containing additional propylene. The method as claimed in claim 15 is somewhat different in that C5+ compounds are removed after removal of propylene product and the second metathesis stage involves a reaction of C4 olefins with ethylene.
5. U.S. Patent No. 6,271,430 to Schwab et al. (the '430 Patent) discloses a method for producing propylene from a process having two metathesis steps. According to col. 2, lines 40-46, in the first step, 1-butene and 2-butene are reacted to give propylene and 2-pentene. In the second step, 2-pentene is reacted with ethylene to give 1-butene and propylene. The net reaction is the reaction of 2-butene with ethylene to form 2 molecules of propylene.
6. Independent claims 1 and 15 of U.S. Patent Application No. 10/620,186 provide that the second metathesis stage involves a reaction between a C4+ stream and ethylene (claim 1) or a C4 stream and ethylene (claim 15). In contrast, as indicated above, the process described in the '430 patent removes the C4 hydrocarbons in step c and the second metathesis stage involves a reaction of C5+ hydrocarbons with ethylene. The process claimed in U.S. Patent Application No. 10/620,186 therefore is not disclosed or suggested in the '430 Patent.
7. The Examples of U.S. Patent Application No. 10/620,186 provide for an increase in propylene production of 12 - 24 % as compared to a conventional process for producing propylene from a C4 raffinate I stream. Based on my experience this result was not expected and was surprising.
8. In the paragraph beginning at col. 2, lines 55, the '430 Patent gives the following examples of streams to be used in the process disclosed therein: pure 1-butene and 2-butene, or a C4 stream from a cracker, in particular a steam cracker or a refining process. One type of stream mentioned is raffinate II. The '430 patent describes raffinate II as a fraction comprising 1-butene, cis/trans-2-butene, isobutene, n-butane and isobutane. Col 2, line 65 to col. 3, line 2 states, "[f]or

BEST AVAILABLE COPY


example, raffinate II can comprise 80-85% by weight of olefins and 15-20% by weight of butanes, with, for example, 25-50% by weight of 1-butene, 30-55% by weight of 2-butene and at most 1-2% by weight of isobutene." (emphasis added). All of the examples in the '430 Patent use raffinate II.

9. The '430 Patent states at col. 3, lines 10-12, "[a]ccording to an embodiment of the invention, the starting material used can be any stream in which 1-butene and 2-butene are present." If this sentence is interpreted to indicate that the process of the '430 Patent can be used with streams containing substantial quantities of isobutylene, it appears to be inconsistent with the prior statement in the '430 Patent about including at most 1-2% by weight of isobutene. Read as a whole, the '430 patent does not appear to teach autometathesis using a C4 stream, such as a steam cracker C4 cut, from which isobutylene has not been removed.

10 In the petrochemical industry, "raffinate II" (also written as "raffinate 2") refers to a C4 stream from which isobutylene has been removed. As shown in Exhibit A, attached hereto, UOP Butene-1 Production Process, raffinate 2 is obtained by extracting butadiene from a steam cracker C4 cut to obtain raffinate 1 and then reacting the isobutylene with methanol to form MTBE, leaving an unreacted C4 stream. This unreacted C4 stream is referred to as raffinate 2. Exhibit B, a publicly available document from Texas Petrochemical LP, shows that raffinate I is the stream after butadiene extraction (butadiene removed). Raffinate II is a stream after MTBE production where isobutylene has been removed (via reaction with methanol). Raffinate III is the stream after butadiene, isobutylene and 1-butene are removed.

I hereby further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believe to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon

July 21, 2006
Date


Robert J. Gartside

BEST AVAILABLE COPY